# Tricks to cut down on water changes



I believe show guppies can be successfully raised with a lot less work than most people typically put in. Life in general seems to get busier for people every year, and unless a guppy hobbyist is retired, it can be more time than we can afford to spend on tank maintenance. Even the retired guys at some point either set up automated water change systems (expensive) or try to figure out other ways to reduce the heavy lifting, sometimes by cutting down their tank numbers.

I have found that guppies will adapt to the conditions under which they are kept, this is why the sterile water guys are successful raising them their way and I do fine raising mine relatively "dirty" with a lot less work involved. These tips can help the sterile water guys keep their water crystal clear longer between changes as well. My water parameters stay good but eventually the build-up of dissolved organics makes the fish sluggish. Doing less water changes sounds like a good idea IF we can get away with it.

There are some tricks that allow greatly reducing the need for water changes. Not everyone will try to stretch it to the extent I do, but I am confident most people could cut their water changes in half by following these tips. I generally have let water changes go for a month or two on smaller tanks and up to 6 months on larger tanks. When I was a kid water changes were a yearly proposition, but the tanks had an inch of gravel that was an effective supplemental bio filter and my tanks were not too crowded and always had plants.

In recent years I kept tanks bare bottom with a layer of mulm and detritus with lots of plants and I would usually wait until the water looked like weak tea and then do 90% changes. Infusoria and protozoans are important in my opinion to let young fish build some immunity and supplemental food, but there can be too much of a good thing, particularly in tanks with adults. The fish can get itchy even with benign protozoans if there are TOO many of them. I have gone back to a shallow gravel layer, maybe 3/4 inch thick, I don't want it too thick so it doesn't get anaerobic. The gravel layer in all my tanks now provides a refuge for infusoria and some failsafe beneficial bio filter bacteria if filtration fails. I squeeze out a used filter over the newly placed gravel to inoculate it.

Keeping live plants like hornwort, najas, water sprite, etc. can help reduce the need for water changes greatly, possibly even almost eliminating the need for changes IF the plant population is high and the fish load is low. This is tried and has been proven in the aquarium hobby by Innes, Axelrod, and others, long before most of us were born. The balanced aquarium concept and the view that aged aquarium water was a good thing has unfortunately lost ground with all the high tech stuff now sold in the hobby today. A lot of modern aquariums are one 24 hour power outage from disaster. An old school planted balanced aquarium with plants and gravel would come through said power outage just fine in most cases.

I will leave it up to you to decide how much modern progress has really helped the aquarium hobby...Would the old time aquarium authors approve of the way things are done

nowadays or shake their heads? Or even angry fists? A lot of things they figured out way back then still work just fine today.

Besides absorbing nitrogen/ammonia, plants also help slow the build-up of the yellowish tinge of dissolved organic compounds that eventually makes the tank water look like tea. I think it is good for the fish to be able to tolerate some degree of less than perfect water conditions, but eventually protozoans build up to high numbers if filtration is weak (conventional box or sponge filters) higher powered filtration might keep populations low but present. Protozoans help break down waste too. If there are too many protozoans, the guppies might start to get itchy and scratch occasionally. I am not referring to bad protozoans that cause disease here, of course we want them gone, but the normally benign kinds can still irritate the fish if their numbers are too high. There is a way to remove these dissolved organics that make the water look like tea and knock down the protozoans to a desirable level that does not irritate the guppies. It is great for control of external parasites. It is a trick that Innes wrote about and the old time aquarists used to clarify the water in their tanks, and I will report that it works as well now as it did then.

Nowadays it is more commonly used to remove dissolved organics in municipal water systems and ornamental fish ponds, but still works just as well in aquariums. That magic bullet is potassium permanganate, AKA permanganate of potash for the old timers. It is also good to control bacterial blooms in the water column and will clear green water, but you might need several fairly heavy doses for green water. It is an effective dip treatment for many external parasites. Properly dosed, it doesn't seem to bother bio filters. It does not bother hornwort in my experience, nor java moss. I have seen cautions that it might harm some plants, but mine seem to grow even better after treatment. Note that you would not want to use this on tanks with crystal clear water with no tinge of yellow organics; if there is a tinge, even if not strong, a small dose should be safe. In tea coloured water the dose can be increased and might need to be repeated several times, but is still much easier than changing water. I would rather dose each tank every week or so to return the water to crystal clear than change water. I think I will be able to extend water changes out to yearly again, or when the gravel can hold no more sediment, whichever comes first.

Hydrogen peroxide can be used in a similar manner, but seems less effective. I have tried 1 ml/gal of drugstore 3% hydrogen peroxide to successfully remove hair algae from java moss in a bucket. The java moss took some damage but recovered, repeated treatments with a lower dose might work better if I had to try it again. Both potassium permanganate and hydrogen peroxide are essentially forms of aquarium and fish safe bleach in the right dosages, and the only breakdown product is water (and the oxygen that is released and oxidizes the organics) in the case of hydrogen peroxide. It is a little trickier to get good consistent results with as it degrades on the shelf fairly quickly. Hornwort is damaged by hydrogen peroxide at that dosage and drops many leaves.

Potassium permanganate breaks down to inert manganese dioxide and a small amount of potassium is released as well, harmless in the amounts used. I think the plants like the potassium supplement. (And manganese is a trace element deficient in my local water) Note that permanganate of potash, as it was called in the old days, is for fresh water aquariums only.

Potassium permanganate in liquid form is also subject to quicker degradation, especially if exposed to light, keep this in mind if you buy it in liquid form and the recommended doses seem insufficient. I prefer using the crystal form of potassium permanganate. Do not get it on your skin or clothing, it will irritate skin and stain just about anything organic it comes in contact with. Dosages might need to be increased in very hard, alkaline water. If the organic load is very high, there might be a film of manganese dioxide deposited on the aquarium glass, it easily wipes off. If filtration and circulation are strong it might not even deposit on glass. I have also seen an account that a pinch of sodium metabisulfite can remove this film but have not confirmed this. I would think sodium thiosulfate (used commonly to remove chlorine) would also remove the film if the tank had lots of organics to begin with. The chemistry store has a website and sells all of those chemicals mail order. http://www.chemistrystore.com/

I have a 55 gal holding tank that usually has several hundred adult guppies in it, I have plants and gravel in it but by 6 months the water still looks like weak tea if not changed, that was my usual interval, the fish were still ok but were not entirely happy and slightly sluggish when it was due for a change. I recently decided to try removing the organics and yellow tinge with potassium permanganate without removing the fish. I treated it several times over a few weeks and it is now crystal clear again. I had a filter plug up on a crowded 2.5 gal tank recently when I went on a trip. On my return the water was putrid since a fairly large pleco died but the guppies were alive. I removed them and decided to hit the tank with a much higher dose of permanganate as an experiment and it was crystal clear in a few days, I wiped the glass with a rag, siphoned the precipitated sediment, and returned the fish and a new filter back into the same water and the water looked as if it was new and the fish were again happy. Potassium permanganate in solution is purple, the correct safe dose if just doing it by eye is that which will turn water a faint pink disappearing by 8 hours. If the pink disappears before 8 hours, you can increase dose a bit till it does remain 8 hours. There is then an intermediate oxidation stage that looks much like the yellow tinge I started with, which clears within the next 24-36 hours to crystal clear if the organics have been fully consumed. Use caution and experiment on tanks with culls first to assess safety or just remove fish from tanks for a couple days while you dose the tanks. I think my 55 gal took a couple teaspoons of crystals divided in many doses over a few weeks that would be enough to kill fish in a tank without a heavy organic load to consume it. (And was probably a much higher than recommended dose even divided as such, but the tank had 6 months of organics from hundreds of fish accumulated and was looking like tea.)

At higher doses than used in an inhabited aquarium, permanganate is a good disinfectant (I think it could be a good alternative to bleach to sterilize equipment) but can stain things including skin. It is actually used to give a decorative patina of age to newly manufactured objects of wood, rope, parchment, etc. In its solid form it can cause combustion if comes into contact with heat ,so be very careful if you use the solid, I prefer it and believe it holds its potency better than liquid on the shelf, it just needs to be used with caution. If you are clumsy it is best to carefully add as much as you think you will need to some to water in a safe place like a sink in case you spill it. Use this solution to dose your tanks a bit at a time. Kordon sells a potassium permanganate solution branded as Permoxyn for the aquarium hobby. The webpage link details usage and dosages and antidotes for overdoses and

cautions and is very informative, probably more so than this article... http://www.novalek.com/kordon/permoxyn/index.htm their recommendations seem conservative but a safe starting point until you gain some experience using it and feel comfortable in dosing based on your individual situation. They recommend 25% water changes after treatments, I ignore that unless there is a lot of precipitate on the bottom. If the organic load is heavy and there is a lot of precipitated stuff on the bottom I would siphon it, so in some cases you might still need a partial change.

It has cut down a lot on time I need to maintain my tanks. I have well water that doesn't need treatment for aquarium use, but others in areas under water use restrictions might find potassium permanganate very useful .In case of a major disaster, it could also be useful to have around to purify drinking water.

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